VII. CONCLUSIONS

Production Conclusions

- Salmon blocks and logs from fillets and mince can be successfully produced from pink salmon harvested commercially in Alaska's common property and cost recovery fisheries. Fish that were not chilled on capture and supported in chilled water tended to be softer and to show more bruising, which required expensive grading and trimming to be used. Gillnet fish often showed bruising in the body meat as well. The best quality was achieved with champagne iced and RSW seine pinks.
- Freshness of the fish was not tested in any systematic way. Fresher fillets were firmer and if properly handled should have lower bacterial loads than older fish. Anecdotal information indicates that commercial production of mince for nuggets by Castle and Cook in the late 70's was highly dependent on the initial fish quality, though they used soft fish.
- Producing boneless skinless frozen salmon products requires filleting and removal of pinbones. There is an obvious tradeoff between fillet speed and yield and equipment cost. Operations have successfully used Baader 195 and 184 fillet machines, and some are now switching to the new 200 series machine. The range in cost is between $100,000 for the 195 and nearly $500,000 for the 200 complete with skinners and handling equipment.
- Pin bone removal remains the principal labor cost and space problem. A large number of trimmers and inspectors is required to keep up with the faster automated fillet equipment. At present there are no proven mechanical pin bone removal tools available.
- Mince can be added back into fillet products up to 15% without significant change in texture. Finer mince mixed with a ribbon mixer coated the fillets the best. When extruded into logs this combination works quite well. Mince can be added up to 25% for some applications.

Yields from Suitable Quality Fresh Pinks

Step	% drop	Resulting Yield, Ave. (round Wt. basis)
H&G	25	75%
Filleting	8-10	65
Belly bones/collars	12-15	53
Deep Skin	4-6	41
V-cut pin bones out	4-7	36
Trim	1-3	34
Mince recovery	4-6	

Mince can be successfully added back at 5% of round weight with little affect, and up to 9% for some applications without compromising "fillet" mouth feel. These percentages do not tolerate sloppy V-cuts or mincing of the whole top strip of the fillet. Without a skilled crew a significant percentage of production would have to be minced.

- The fillet log product has significant advantages in terms of product stability, and few disadvantages for many applications where formed or chunk product will be produced. It is less labor intensive and lends itself easily to adding mince or other additives.
- The block market can also be supplied, but without additional cryoprotection, such as colder holding temperatures producers should be cautious about their ability to provide suitable product for more than six months. Reprocessed frozen fish can be used for up to three months without significant problems, but beyond that thaw drip became excessive. Together, these result in 9-10 months availability of untreated blocks.
- Holding h&g pinks for reprocessing at -20° F should reduce thaw drip and rancidity development. This lead was not pursued.
- Producers should carefully evaluate the results of the bacteriological tests. Most important to new frozen fillet producers are the possibility of non-pathogenic coliform buildup on filleting and mincing equipment that does not yield to conventional cleanup as practiced in canneries. It appears that addition of a caustic strip following foaming and high pressure washing is necessary. TSP has been suggested as an agent that would do the job. A rinse with highly chlorinated water should follow.

Marketing Conclusions

Food Companies

- The market that was interested in 1985-1987 will need to be reassessed. The interest was there at the right price if production was steady. It remains to be seen whether the product can be produced at a price consistent with market expectations. Fish price is obviously critical, and some method for stabilizing prices is likely required to get major food companies interested again.
- Block products are problematic due to the need for cryoprotection. There are many other intermediate products that do not have this problem, and producers should carefully evaluate the end users actual requirements. Formed and chunk products do not require rectangular dimensions.
- More work needs to be done looking at users of chunk meat products, especially with the logs. Stuffed and pastry products, soups, and other possibilities abound.

Foodservice

- There are significant opportunities in the foodservice sector. This is probably the lowest cost and volume approach to introduction of new products.

- The fillet log can produce a product that can be portioned at the serving site. Depending on the application, breading can help mask the variable color that results from the lateral line.